What is claimed is:

1.   An equalizer of an optical recording/reproducing apparatus comprising:

a feedforward (FF) unit having a feedforward filter for removing pre-cursor from inter-symbol interference of an input signal and outputting a FF output signal;

a feedback (FB) unit having a feedback filter for predicting post-cursor of the inter-symbol interference and outputting a result of the prediction in a FB output signal;

a first adder and a second adder, each for adding the output signal from the FF unit and the output signal from the FB unit, to remove the inter-symbol interference, and respectively outputting a first output signal and a second output signal;

a slicer for deciding a level of the first output signal from the first adder to be a predetermined level and feeding back a predetermined level signal to the FB unit; and

a signal detection unit for outputting the second output signal having the inter-symbol interference removed by the second adder as a predetermined signal, using at least one of a trellis structure method and a tree structure method.

2.   The equalizer of claim 1, further comprising:

an error calculating unit for calculating equalizing error value, using the first output signal from the first adder and the predetermined level signal from the slicer,

wherein the FF unit and the FB unit update respective tap coefficients of the feedforward filter and the feedback filter based on the equalizing error value.

3. The equalizer of claim 1, wherein the signal detection unit comprises a given number of delay elements corresponding to a reference clock of the optical recording/reproducing apparatus, wherein the predetermined signal from the signal detection unit is outputted after being delayed for a certain period of time, and is outputted in synchronization with the reference clock after the certain period of time.

4. The equalizer of claim 1, wherein the trellis structure method and the tree structure method have a given decision delay (τ), where $\tau \geq 3$.

5. An equalizing method of an optical recording/reproducing apparatus comprising:

a step of removing pre-cursor from inter-symbol interference of input signal by a feedforward (FF) filter and outputting a FF output signal;

a step of predicting post-cursor of the inter-symbol interference and outputting a result of prediction by a feedback (FB) filter in a FB output signal;

a step of first adding the FF output signal having the pre-cursor removed and the FB output signal having the predicted post-cursor, to remove the inter-symbol interference and outputting a first output signal;

a step of second adding the FF output signal having the pre-cursor removed and the FB output signal having the predicted post-cursor, to remove the inter-symbol interference and outputting a second output signal;

a step of deciding a level of the first output signal from the first adding step to be a predetermined level and feeding back a predetermined level signal to the feedback filter; and

a step of detecting the second output signal outputted from the second adding step as a predetermined signal, using at least one of a trellis structure method and a tree structure method.

6.   The method of claim 5, further comprising the step of calculating equalizing error value using the first output signal outputted from the first adding step and the predetermined level signal and updating respective tap coefficients of the feedforward filter and the feedback filter.

7.   The method of claim 5, wherein the signal from the detecting step is outputted after being delayed for a certain period of time by a given number of delay elements corresponding to a reference clock of the optical recording/reproducing apparatus, and is outputted in synchronization with the reference clock after the certain period of time.

8.   The method of claim 5, wherein the trellis structure method and the tree structure method have a given decision delay (τ), where $\tau \geq 3$.

9.   An equalizer of optical recording/reproducing apparatus comprising:

a feedforward (FF) unit having a feedforward filter for removing pre-cursor from inter-symbol interference of input signal and outputting a FF output signal;

a feedback (FB) unit having a feedback filter for predicting post-cursor of the inter-symbol interference and outputting a result of prediction in a FB output signal;

a first adder and a second adder, each for adding the output signal from the FF unit and the output signal from the FB unit, to remove the inter-symbol interference; and respectively outputting a first output signal and a second output signal; and

a signal detection unit for detecting the second output signal from the second adder as a predetermined signal using at least one of a trellis structure method and a tree structure method, and feeding back the predetermined signal to the FB unit,

wherein the FB unit predicts the post-cursor based on the predetermined signal that is feedback from the signal detection unit after a certain period of time.

10.   The equalizer of claim 9, further comprising:

a slicer for deciding a level of the first output signal from the first adder to be a predetermined level and feeding back a predetermined level signal to the FB unit; and

an error calculating unit for calculating equalizing error value, using the first output signal from the first adder and the predetermined level signal from the slicer,

wherein the FF unit and the FB unit update respective tap coefficients of the feedforward filter and the feedback filter based on the equalizing error value.

11.   The equalizer of claim 9, wherein the signal detection unit comprises a given number of delay elements corresponding to a reference clock of the optical recording/reproducing apparatus, wherein the predetermined signal from the signal detection unit is outputted after being delayed for the certain period of time, and is outputted in synchronization with the reference clock after the certain period of time.

12.   The equalizer of claim 9, wherein the trellis structure method and the tree structure method have a given decision delay (τ), where $\tau \geq 3$.

13.   An equalizing method of optical recording/reproducing apparatus comprising:

a step of removing pre-cursor from inter-symbol interference of input signal by a feedforward filter and outputting a FF output signal;

a step of predicting post-cursor of the inter-symbol interference and outputting the result of prediction by a feedback filter in a FB output signal;

a step of first adding the FF output signal having the pre-cursor removed and the FB output signal having the post-cursor predicted, to remove the inter-symbol interference, and outputting a first output signal;

a step of second adding the FF output signal having the pre-cursor removed and the FB output signal having the post-cursor predicted, to remove the inter-symbol interference, and outputting a second output signal; and

a step of detecting the second output signal outputted from the second adding step as a predetermined signal, using at least one of a trellis structure method and a tree structure method and feeding back the detected predetermined signal to the feedback filter,

wherein the step of detecting the second output signal outputted from the second adding step further inputting the detected predetermined signal to the feedback filter after a certain period of time.

14.   The method of claim 13, further comprising:

a step of deciding the first output signal outputted from the first adding step to be a predetermined level and feeding back the predetermined level signal to the FB unit; and

a step of calculating equalizing error value using the first output signal outputted from the first adding step and the predetermined level signal and

updating respective tap coefficients of the feedforward filter and the feedback filter.

15.   The method of claim 14, wherein the predetermined level signal from the step of deciding the first output signal is outputted after being delayed for the certain period of time by a given number of delay elements corresponding to a reference clock of the optical recording/reproducing apparatus, and is outputted in synchronization with the reference clock after the certain period of time.

16.   The method of claim 13, wherein the trellis structure method and the tree structure method have a given decision delay (τ), where $\tau \geq 3$.